

REMARKS

The comments of the applicant below are each preceded by related comments of the examiner (in small, bold type).

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the thermoplastic bonding component is placed downstream of the ink channel and the piezoelectric is positioned to subject ink within the ink channel to jetting pressure (claims 122, 125, 127), the thermoplastic bonding component is placed between the ink channel and the orifice plate and the piezoelectric is positioned to subject ink within the ink channel to jetting pressure (claims 123, 126, 128) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Figures 1A, 1B, and 4 show a thermoplastic bonding component 100 (figure 4) downstream of an ink channel 22 (figure 1B) that is assembled in a collar element 10 (figures 1A and 4). The thermoplastic bonding component 100 of figure 4 is also upstream of an orifice plate 14 and therefore is between the ink channel 22 and the orifice plate 14 (figures 1A and 4). Figures 1B and 3 show a piezoelectric element 34 covering the ink channel 22 to subject ink within the ink channel to a jetting pressure.

Claims 122, 123, and 125-1 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 122, 125, and 127, the first bonding component is placed downstream of the ink channel is unclear. Is the ink channel upstream of the first bonding component?

The applicant does not understand what is unclear about the first bonding component being placed downstream of the ink channel and respectfully asks the examiner for clarification.

Claims 123, 126, and 128, the first bonding component is placed between the ink channel and the orifice plate is unclear. Is the ink channel shown in Fig. 4? Does the ink channel run through the first bonding component and the orifice plate? The remaining claims are also rejected under 35 U.S.C. § 112, second paragraph, for being dependent upon a rejected base claim.

Figure 4 shows an example in which the first bonding component 100 is between the collar element 10 and the orifice plate 14. Figures 1A and 1B show an example in which the ink channel 22 is within the collar element 10.

Claims 29, 33, 35, 36, 38, 39, 45, 48, 50, 52, 54-58, 60, 61, 85-87, 92-96, and 11 0-1 13, 1 15-1 17, and 11 9-1 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. (US 6,755,511) in view of Baker (US 6,084,618).

Regarding claims 29, 45, and 52, Moynihan et al. discloses an apparatus (ink jet head, Fig. 1) and method (Fig. 1) comprising a piezoelectric element (34, 34') and a first bonding component heat-bonded to a surface the apparatus (column 3, lines 2-3);

Regarding claims 122, 125, and 127, Moynihan et al. discloses the first bonding component is placed downstream of the ink channel (Fig. 1; column 2, lines 32-34).

However, Moynihan et al. does not disclose:

- regarding claim 29, 45, and 52, the first thermoplastic bonding component covering the ink channel and is patterned to include a filter.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. with the thermoplastic filter and thermoplastic bonding materials as disclosed by Baker for the purposes of preventing particles from flowing downstream to the nozzles and bonding.

As the examiner conceded, Moynihan did not describe and would not have made obvious that the first thermoplastic bonding component covers the ink channel and is patterned to include a filter, as recited by claim 1. However, contrary to the examiner's assertion, Moynihan also did not describe or would not have made obvious the first thermoplastic bonding component being "placed downstream of the ink channel", also recited by amended claim 1. Moynihan fixes a piezoelectric element to a flex using a thin layer of epoxy (column 3, lines 2-3). Even if Moynihan's thin layer of epoxy were interpreted to be the first thermoplastic bonding component of claim 29, 45, or 52, the thin layer of epoxy is not placed downstream of an ink channel (figure 1 and column 3, line 55, to column 4, line 6).

Nevertheless, Baker discloses the first thermoplastic bonding component (column 3, lines 34-37) covers the ink channel (Figs. 1, 2) and is patterned to include a filter (32) (Figs. 3), the first thermoplastic bonding component includes an adhesive polyimide (column 3, line 36), the first thermoplastic bonding component includes a plurality of openings (34), the filter includes a repeating pattern of units having a plurality of openings (30, 32, Fig. 2) for the purpose of preventing particles from flowing downstream to the nozzles (Fig. 3). Furthermore, Baker discloses the polymer sheet (30) can be used for bonding (column 3, lines 34-37). In light of the first bonding component disclosed by Baker, it would be obvious to provide the second bonding component as a thermoplastic bonding component.

Baker places a filter downstream of an ink reservoir and upstream of a heater chip so that particles in ink delivered from the ink reservoir are prevented from entering vias (ink channels) of the heater chip. As Baker explains:

Ink from ink reservoir 44 flows through filter 42 into inlet 46 of standpipe 40 where any particles within ink reservoir 44 are prevented from flowing into standpipe 40 by filter 42. The ink exits standpipe 40 via outlet 48 and is distributed through holes 34 of filter 32. Particles originating after filter 42 will not flow through holes 34. The size of particles prevented from flowing through filter 32, of course, depends on the size of holes 34. The ink thereafter flows into vias 50 of heater chip 28. Upon bubble formation by heaters (not shown) in heater chip 28 as is known in the art, the ink is forced through nozzles 38 in nozzle plate 36. Filter 32 is thus downstream of ink reservoir 44 and will filter particles originating in standpipe 40 and thereafter. (col. 4, lines 10-24.)

One skilled in the art would not have incorporated Baker's filter into Moynihan's printhead, because Moynihan did not identify the location of an ink reservoir with respect to the ink channel and it would have been impossible for one skilled in the art to know where and how Baker's filter could be placed downstream of an ink reservoir and upstream of ink channels and be used as intended within Moynihan's printhead.

One skilled in the art would not have replaced Moynihan's thin layer of epoxy with Baker's filter as the examiner suggested, because ink does not pass through the layer of epoxy and Baker's filter would not have been useful.

Even if one had tried to use Baker's filter in Moynihan's printhead, one would not have placed the filter downstream of Moynihan's ink channel, but rather upstream of the ink channel to prevent particles from entering the channel, for which Baker's filter is intended.

Accordingly, neither Moynihan nor Baker, alone or in combination, described or would have made obvious the features of claim 29. Claims 45 and 52 each contains features similar to those of claim 29 and are patentable for at least similar reasons to those discussed with respect to claim 29. The dependent claims are patentable for at least the reasons discussed with respect to the independent claims from which they depend.

Claims 32, 57, 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 52 above, and further in view of DeYoung et al. (US 4,751,774).

Claims 41, 42, 51, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29, 45, 50, and 52 above, and further in view of Admitted Prior Art of Fig. 5 (APA).

Claims 43 and 97-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 45 above, and further in view of Kishima (US 6,109,737).

Claims 32, 41-47, 51, 57, 63-64, 97-99, and 118 are patentable for at least the reasons discussed with respect to the independent claims from which they depend.

All of the dependent claims are patentable for at least similar reasons as those for the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made

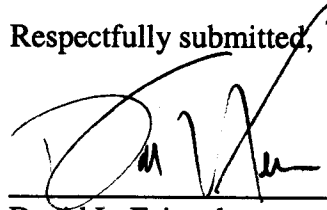
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arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,



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